

WHAT IS CLAIMED IS:

1. A method for implementing a navigation key function in a mobile communication terminal using fingerprint-recognition, the mobile communication terminal including a fingerprint-recognition sensor divided into a plurality of image detection blocks, the method comprising the steps of:
 - 5 recognizing a fingerprint over at least one of the plurality of image detection blocks;
 - obtaining a directional characteristic corresponding to a direction indicated by the at least one of the plurality of image detection blocks that has recognized the fingerprint;
 - 10 and
 - determining a directional value based on the obtained directional characteristic to perform a corresponding directional process.
2. The method as set forth in claim 1, further comprising the step of authenticating a fingerprint of a user to prevent an unauthorized person from using the mobile communication terminal.
3. The method as set forth in claim 1, wherein the mobile communication terminal further includes a pressure detection sensor to detect a pressure of the fingerprint,
 - 15 simultaneously with the directional characteristic corresponding to the direction indicated by the at least one of the plurality of image detection blocks that has recognized the fingerprint.
4. A method for implementing a navigation key function in a mobile communication terminal based on a fingerprint-recognition, the mobile communication terminal including a fingerprint-recognition sensor, the method comprising the steps of:
 - 20 authenticating a user by processing an image of a fingerprint input by the user, when the operation of the fingerprint-recognition sensor is in a user authentication mode;

detecting subparts of the input fingerprint image when the operation of the fingerprint-recognition sensor is not in the user authentication mode but in a navigation key input mode;

5 after dividing the processed image into subparts of predetermined size, determining a direction toward which the fingerprint image is biased with respect to the entire fingerprint-detection region, based on the processed image for each direction; and

outputting a signal of the determined direction as a selected navigation direction and performing a control corresponding to the output signal

5. The method as set forth in claim 4, further comprising the step of repeating inputting of fingerprint by n times upon fingerprint authentication if the input fingerprint is not identical with a registered fingerprint.

6. The method as set forth in claim 4, wherein the navigation direction is one of up, down, left, and right.

7. A method for implementing a navigation key function in a mobile communication terminal based on a fingerprint-recognition, the mobile communication terminal including a fingerprint-recognition sensor, the method comprising:

10 an initial check step including the steps of (1) releasing a lock of the mobile communication terminal in response to input of a fingerprint or secret number, provided that the mobile communication terminal is locked, and (2) in response to a key or fingerprint input, checking whether the operation of the mobile communication terminal is in a key-input setting mode, provided that the terminal is unlocked or the lock is released;

15 a registration step including (a) an initial registration step of performing an initial registration by inputting an identical fingerprint one or more times; (b) a registration-fingerprint input step of inputting a registered fingerprint; (c) an additional fingerprint registration step of additionally registering a fingerprint; and (d) a fingerprint

deletion step of deleting a registered fingerprint, provided that the operation of the terminal is in a fingerprint registration mode; and

5 a directional process step of (i) checking whether the input fingerprint is identical with a registered one when the operation of the terminal is in a fingerprint authentication mode; (ii) obtaining a directional characteristic of subparts of the input fingerprint when the operation of the terminal is not in the fingerprint authentication mode, and (iii) determining a fingerprint input navigation direction based on the obtained directional characteristic.

8. The method as set forth in claim 7, further comprising the step of passing through n times repeated input of fingerprint upon fingerprint authentication if the input fingerprint is not identical with a registered fingerprint.

9. The method as set forth in claim 7, wherein the navigation direction is one of up, down, left, and right.

10. The method as set forth in claim 7, wherein in the directional process step are selected n blocks in the input fingerprint-detection region for the input fingerprint and then a direction corresponding to a block having a highest summed value according to the following equations, among the n blocks, is selected as a corresponding navigation direction (P_{UP} , P_{LEFT} , P_{DOWN} , P_{RIGHT}):

$$\text{Position}[i,j] = \sum_{x=i}^{i+k} \sum_{y=j}^{j+k} \text{pixel-value}[x,y] \quad | \quad i,j = k, 11k, 10k \dots \text{(by } k \text{ pixels)}$$

10 $P_{UP} = \text{Position}[k,k] + \text{Position}[11k,k] + \text{Position}[10k,k]$

$$P_{LEFT} = \text{Position}[k,k] + \text{Position}[k,11k] + \text{Position}[k,20k]$$

$$P_{DOWN} = \text{Position}[k,20k] + \text{Position}[11k,20k] + \text{Position}[20k,20k]$$

$$P_{RIGHT} = \text{Position}[20k,k] + \text{Position}[20k,11k] + \text{Position}[20k,20k]$$

11. The method as set forth in claim 7, wherein in the directional process step the navigation direction (P_{UP} , P_{LEFT} , P_{DOWN} , P_{RIGHT}) is determined according to a highest value obtained by detecting all pixels of the n blocks.

12. The method as set forth in claim 7, wherein in the directional process step the navigation direction (P_{UP} , P_{LEFT} , P_{DOWN} , P_{RIGHT}) is determined such that, as expressed in the following equation, the input fingerprint-detection region is divided by radial lines at a multiple of angle A° and n pixels on each radial lines is detected for selecting radial lines on which $n/4$ pixels or more corresponding to the fingerprint are detected, and a direction corresponding to a radial line having a highest detection values is determined as a navigation direction:

$$\text{Position}[\angle] = \sum_{i=1}^{124} \text{pixel-value}[\angle] \mid \angle = 0, A^\circ, 2A^\circ, 3A^\circ$$

$$P_{UP} = \text{Position}[A] + \text{Position}[2A] + \text{Position}[3A]$$

$$P_{LEFT} = \text{Position}[3A] + \text{Position}[4A] + \text{Position}[5A]$$

$$P_{DOWN} = \text{Position}[5A] + \text{Position}[6A] + \text{Position}[7A]$$

$$P_{RIGHT} = \text{Position}[7A^\circ] + \text{Position}[0] + \text{Position}[A^\circ]$$

5 13. The method as set forth in claim 7, wherein in the directional process step the navigation direction (P_{UP} , P_{LEFT} , P_{DOWN} , P_{RIGHT}) is determined by summing detected values for a specific x-coordinate and a specific y-coordinate, respectively, as expressed by the following equation, and then selecting a diagonally-divided portion, which includes a center-of-weight position (x,y) corresponding to the highest detected values:

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$$\text{Position}[x] = \sum_{i=0}^{220} \text{pixel-value}[x,i] \mid i = 0, 1, 2, \dots, 220$$

$$\text{Position}[y] = \sum_{i=0}^{220} \text{pixel-value}[y,i] \mid i = 0, 1, 2, \dots, 220$$